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| 10/772,116 | 02/03/2004 | David Stanbridge | P/1034-70 | 4297 |

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| EXAMINER |
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HOPKINS, ROBERT A

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| ART UNIT | PAPER NUMBER |
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1724

DATE MAILED: 07/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/772,116

Applicant(s)

STANBRIDGE, DAVID

Examiner

Robert A. Hopkins

Art Unit

1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-22,24-26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-13,16,18-22,24-26,28 and 29 is/are rejected.
- 7) ☒ Claim(s) 14,15,17 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2-3-04,5-21-04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7,9-13,16,28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Echols(4629481) taken together with Barrett et al(3173771).

Echols teaches a separating cyclone for at least partially separating a mixture of fluids of different density into a light fraction with a relatively low density and a heavy fraction with a relatively high density comprising an outer casing(36) which defines a flow space through which the mixture is to flow, an inlet(36a) connected distally to the outer casing for admitting the mixture into the flow space, a flow body(38) disposed in the flow space wherein the mixture can be guided in a flow direction through the flow space and between the flow body and the outer casing and wherein the flow body has a distal part of decreasing diameter(figure 4) in the flow direction, a rotator device(50) in the flow space for setting into rotation the mixture for separating, a first outlet(44) connected proximally to the outer casing for discharging the heavy fraction from the flow space, a second outlet(42) disposed in the flow space for discharging the light fraction from the flow space. Echols is silent as to at least one bypass channel at the distal part of the flow body, each bypass channel being shaped and positioned for guiding a part of the mixture flowing along the flow body in the flow direction. Barrett et al teaches a

Art Unit: 1724

separating cyclone having an outer casing(11), an inlet, a flow body(32) disposed in the flow space, a rotator device(46) for setting into rotation the mixture for separating, and at least one bypass channel(11a in figures 10 and 11) at the distal part of the flow body, each bypass channel being shaped and positioned for guiding a part of the mixture flowing along the flow body in the flow direction. It would have been obvious to someone of ordinary skill in the art at the time of the invention to provide at least one bypass channel at the distal part of the flow body of Echols, each bypass channel being shaped and positioned for guiding a part of the mixture flowing along the flow body in the flow direction so that the tangential component of the velocity of the liquid between the inner core and the bypass channel wall is substantially the same as the tangential component of the velocity at points intermediate the inner core and outer casing(column 4 lines 36-52 and column 12 lines 5-38 of Barrett et al), thus increasing the separation efficiency of the separator.

Barrett et al further teaches wherein the bypass channel is substantially annular in a cross section through the flow body, and is coaxial with the flow body. Echols further teaches wherein the distal part of the flow body has a conical form. Barrett further teaches wherein the inlet part extends axially relative to the outer casing and debouching in the flow space. Echols further teaches wherein the rotator device comprises at least one swirl blade shaped and oriented for causing the mixture to swirl as it flows. Echols further teaches wherein the rotator device is fixed to the flow body. Echols further teaches wherein the outer casing has an inner side and the rotator device is formed by the inner side of the outer casing. Echols further teaches wherein the inner

Art Unit: 1724

side of the outer casing is cylindrical. Echols further teaches wherein the first outlet comprises a discharge pipe(44) extending coaxially with the flow space.

Echols teaches all of the limitations of claim 7 but is silent as to wherein the inlet comprises an inlet part extending tangentially relative to the flow space and debouching in the flow space. Examiner respectfully submits that separators having a tangential inlet along with spinner vanes are well known in the separation art, therefore it would have been obvious to someone of ordinary skill in the art at the time of the invention to provide a tangential inlet together with the spinner vanes of Echols to increase the centrifugal speed of the mixture before entering the spinner vanes.

Claims 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Echols(4629481) taken together with Barrett et al(3173771).

Echols teaches a flow body(38) for placement into a separating cyclone for at least partially separating a mixture of fluids of different density into a light fraction with a relatively low density and a heavy fraction with relatively high density, wherein the flow body comprises a proximal part on which a rotating device(50) is arranged for setting into rotation the mixture flowing along the body, and also comprises a distal part of decreasing diameter in a flow direction of the mixture. Echols is silent as to at least one bypass channel at the distal part via which a part of the fluid flowing along the flow body can be guided. Barrett et al teaches a separating cyclone having an outer casing(11), an inlet, a flow body(32) disposed in the flow space, a rotator device(46) for setting into rotation the mixture for separating, and at least one bypass channel(11a in figures 10 and 11) at the distal part of the flow body, each bypass channel being shaped and

Art Unit: 1724

positioned for guiding a part of the mixture flowing along the flow body in the flow direction. It would have been obvious to someone of ordinary skill in the art at the time of the invention to provide at least one bypass channel at the distal part of the flow body of Echols via which a part of the fluid flowing along the flow body can be guided so that the tangential component of the velocity of the liquid between the inner core and the bypass channel wall is substantially the same as the tangential component of the velocity at points intermediate the inner core and outer casing(column 4 lines 36-52 and column 12 lines 5-38 of Barrett et al), thus increasing the separation efficiency of the separator.

Barrett et al further teaches wherein the bypass channel is substantially annular in a cross section through the flow body, and is coaxial with the flow body. Echols further teaches wherein the distal part of the flow body has a conical form.

Claims 24-26,29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Echols(4629481) taken together with Barrett et al(3173771).

Echols teaches a method for at least partially separating a mixture of fluids of different density into a light fraction with a relatively low density and a heavy fraction with relatively high density comprising feeding the mixture for separating into a flow space defined by and between an outer casing(36) and a flow body(38), setting the mixture into rotation in the flow space, guiding the mixture, once set into rotation, along the flow body disposed in the flow space, discharging the heavy fraction via a first outlet connected proximally to the outer casing, discharging the light fraction from the flow space via a second outlet disposed in the flow space. Echols is silent as to guiding a

Art Unit: 1724

part of the mixture flowing along the flow body through at least one bypass channel arranged in the flow body. Barrett et al teaches a separating cyclone having an outer casing(11), an inlet, a flow body(32) disposed in the flow space, a rotator device(46) for setting into rotation the mixture for separating, and at least one bypass channel(11a in figures 10 and 11) at the distal part of the flow body, and a step of guiding a part of the mixture flowing along the flow body through at least one bypass channel arranged in the flow body. It would have been obvious to someone of ordinary skill in the art at the time of the invention to provide a step of guiding a part of the mixture of Echols flowing along the flow body through at least one bypass channel arranged in the flow body so that the tangential component of the velocity of the liquid between the inner core and the bypass channel wall is substantially the same as the tangential component of the velocity at points intermediate the inner core and outer casing(column 4 lines 36-52 and column 12 lines 5-38 of Barrett et al), thus increasing the separation efficiency of the separator.

Echols teaches all of the limitations of claim 26 but is silent as to tangentially supplying the mixture for separating and using the outer casing, setting into rotation the mixture flowing therealong. Examiner respectfully submits that separators having a tangential inlet along with spinner vanes are well known in the separation art, therefore it would have been obvious to someone of ordinary skill in the art at the time of the invention to provide a tangential inlet together with the spinner vanes of Echols to increase the centrifugal speed of the mixture before entering the spinner vanes.

Allowable Subject Matter

Claims 14,15, 17,30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 14 recites "wherein the outer casing has a decreasing diameter at the position of the distal part of the flow body". Echols teaches a cylindrical outer casing. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an outer casing which has a decreasing diameter at the position of the distal part of the flow body because Echols does not suggest such a modification. Claim 15 depends on claim 14 and hence would also be allowable upon incorporation of claim 14 into claim 1.


Claims 17 and 30 recites "wherein the second outlet comprises a discharge channel extending through the flow body, the discharge channel has an inlet opening which is positioned at the distal end of the flow body". Echols teaches a second outlet at the end of the flow space. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a second outlet which comprises a discharge channel extending through the flow body, the discharge channel has an inlet opening which is positioned at the distal end of the flow body because Echols does not suggest such a modification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A. Hopkins whose telephone number is 571-272-1159. The examiner can normally be reached on Monday-Friday, 7am-4pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RAH
June 29, 2005


ROBERT A. HOPKINS
PRIMARY EXAMINER
A.U. 1724